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of convergent evolution,¹ as well as an illustration of how dangerous it may prove to interpret a phenomenon in one cultural complex by means of the results reached in the study of another.

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TRACES OF THE STONE AGE AMONG THE EASTERN AND NORTHERN TRIBES

ONE of the most frequent plaints of the archeologist is that the descendants of our native Indian tribes have no knowledge whatever of the arts and manufactures of the stone age. This is a charge which, while to a great extent correct, is nevertheless not quite so sweepingly true as many believe, and the searcher seldom fails to find some recollections of stone-age industries.

It is constantly asserted by certain students that the historic Indians did not make stone arrow-points, but used bone, antler, or some other substance to the complete exclusion of stone. Archeological and documentary evidence aside, there are numerous definite traditions to the contrary among our Eastern tribes. I shall quote a few that have come to my personal notice.

In 1904 there were several Seneca Iroquois still living on the Cattaraugus reservation in western New York who remembered the process, and one, William Blueskye, had himself made and used stone arrow-points as a boy. He still retained the art, and chipped rather clumsy points from flint pebbles by means of a pebble hammerstone alone, not using a bone flaker. He said that it was difficult to get flint that would chip properly, as most of the stone found on the surface was too dry. Freshly quarried flint was better for the purpose. He claimed that the Seneca formerly boiled the flint for several days, along with medicine herbs, to make it flake more easily.

This latter statement is corroborated by old Menomini, who say that the fat of large animals was boiled with the stone. When Hoffman wrote,² he spoke as though the Menomini of his time were still cognizant of the art, but it has now passed into oblivion, except in the instance

¹ I trust Mr Lang is no longer in doubt as to the meaning of the term "convergent evolution". For a somewhat detailed treatment of this topic I should refer him to Dr Lowie's article "On the Principle of Convergence in Ethnology" (*Journal of American Folk-Lore*, Jan.-Mar., 1912).

² Hoffman, The Menomini, *14th Ann. Rep. Bur. Amer. Ethnol.*, p. 256.

mentioned. I have collected several ancient stone arrows, picked up and shafted by the Menomini. In each case the head of the shaft was made to swell laterally to take the point, a feature that may be observed in Iroquois models of a similar nature in the collection of the American Museum of Natural History. The Winnebago, Siouan neighbors of the Menomini, claim no knowledge of the manufacture of stone points. It is quite possible that they never made them.¹

In some localities the Eastern Cree of the Hudson's Bay region used chipped stone points made by percussion. In others they preferred points and blades rubbed from slate, like the flat-rubbed blades found in New England and western New York, and still used among the Eskimo. One interesting feature was the presence in former times of a semilunar scraper of rubbed slate, exactly like the Eskimo woman's knife. Their crooked knives were made of beavers' teeth, and so were little chisels for work on snowshoes.

The Eastern Cree still hold in memory the days when they used grooved stone axes. The blade was set in a handle, split at one end to fit the groove, and the haft was then bound above and below the split with deerskin. Fire was not used by the Cree as an aid to chopping. Stone celts were fastened in wooden handles, the haft being at right angles to the blade as in an adze. These were used to chisel ice. The Cree of Moose Factory say that some axes, used especially to cut firewood, were made of moose, deer, or caribou shoulder blades, or beaver rump bones.

The Saulteaux Ojibwa used stone celts, hafted like Cree grooved axes. They were considered hard to make, and were very scarce, usually only one being in the possession of a single family.

Stone celts are well remembered by the Seneca, who have told me how they were hafted in a pierced handle, and used, with fire, held in check by clay swabs, as the active agent, in cutting down trees and in other wood work. The stone tool was used to hack away the charcoal. Mr M. R. Harrington has described a hafted stone celt collected from the Cayuga.²

The writer recently purchased a round, flat, water-worn pebble from a Menomini woman, who claimed that it was formerly used to polish and sharpen bone awls. It is the counterpart of other rubbing stones I have found on prehistoric sites in New York, New Jersey, and Massachusetts. Bone awls are out of date, but I have collected several metal awls hafted

¹ Radin, Some Aspects of Winnebago Archeology, *American Anthropologist*, 1911, vol. 13, no. 4, p. 536.

² *American Anthropologist*, 1909, vol. xi, no. 1, p. 86.

in elaborate carved bone or antler grips, from both Menomini and Winnebago.

One point in a recent controversy between two well-known writers on anthropology hinged on whether or not bone celt-like objects are used by the Minnesota Ojibwa. Just north of Minnesota, in Canada, I have collected bone beaming-tools made from the shin-bones of moose, caribou, and deer, and used in removing the hair from deerskin; and toothed and plain fleshers and scrapers, some of the plain fleshers having celt-like blades. Among the Eastern Cree all these types are found, and, in addition, a small celt-like bone implement used as a wedge to push back the hide is employed in skinning deer. Possibly there is some truth in the oft-repeated tradition which calls the stone celt a "skinning knife"; very thin celts certainly could be so used. The Cree toward Labrador formerly used stone and bone celts fastened perpendicularly to long wooden handles to chisel ice.

In addition there are still in use among the Winnebago and Menomini long, thin bone needles with a central perforation, made from the ribs of some large animals such as the buffalo, and designed for sewing together reeds to make wigwam mats, while smaller needles for weaving snowshoe webs are found among the Menomini, Ojibwa, and Eastern Cree. I have also obtained a bone hook and a hollow bone needle-case from the latter. Beads made from hollow bird-bones, cut in sections, exactly like those found on prehistoric Eastern sites, may still be seen among Winnebago and Menomini, and from the Ojibwa of Sac Seul I have collected one small needle, made of the perforated penis bone of the martin and used in sewing garments.

Charlie Sabattis, the well-known half Abenaki Adirondack guide, once showed me the spot where his father had shot his first moose with a bone-headed arrow. Both Sabattis and Blueskye, the Seneca, assured me that antler arrow-points were easily made by boiling the prongs until they were soft enough to cut "like cheese." Later, when at work with Mr M. R. Harrington in excavating a very early historic Erie village and burial site¹ at Ripley, Chautauqua county, New York, we found numerous points of antler, discarded cores, and long curling shavings of the same material, which must have been removed from the prongs with a stone knife or scraper, and this was only possible if the antler was in a "cheesy" state.

¹ The work on this site was afterward completed for the New York State Museum by Mr A. C. Parker, and furnished the material for his bulletin entitled "An Erie Indian Village and Burial Site," *Bulletin 117, N. Y. State Museum*.

Mr M. R. Harrington has collected several stone gorgets of both the simple and double-holed type among the Canadian Iroquois and Delawares. The single-holed form was used generally as a pendant by Iroquois owners; the double-holed variety served as a hair ornament among the Delawares.

Stone pipes are still used, to my personal knowledge, by the Eastern Cree, Ojibwa, Winnebago, Menomini, and Tuscarora. Doubtless, however, the modern method of manufacturing these things is different from that practised long ago.

Pottery is no longer made by the Iroquois, and was never used by the Eastern Cree, who preferred stone vessels pecked into shape. The Seminole of Florida still remember when earthenware was used, and doubtless the old people know how to make it. Ojibwa from Cat Lake, north of Sac Seul, Canada, told me that they very recently made stone vessels and earthenware, for which they employed the coil process.¹ My Menomini notes tell a different story.

"Pottery vessels are said not to have been made or used for over one hundred years, yet the memory of the process still lingers. They were made from selected clay which was pounded and mixed with pulverized shells for tempering. When the clay was properly compounded, more water was added, and it was kneaded into a stiff paste which was plastered by the hands over a large ball of basswood bark twine, leaving one end uncovered. The clay was next smoothed off with a stick and the incipient vessel was set in the sun to dry. In fact, sunshine was considered such a necessary factor in the drying process that no one ever made pottery on a dull day.

"When the clay coating was dry, the potter took hold of the end of the ball of twine which protruded from the opening left for that purpose, and, pulling it, unwound the ball within and left the earthen shell. Fresh clay was then daubed over the rough inside and the vessel was scraped smooth with a stick, outside and in. The kettle was next sized with a coating of finer clay, and ornamented with incised designs made by a sharpened stick. Holes were then bored near the rim to receive a bail of basswood bark. The vessel was dried again, and it was then ready for use without further treatment. It was not fired, but became baked by the flames when in use.

"It is said that bowls and spoons were made of clay before wood came into use. The first iron and brass kettles of commerce are thought to have been thrown up on earth to sacred dreamers by the Underneath Powers; probably this is a survival of a tradition in vogue when pots were made of earth, the property of the Gods Below."

If I had chosen to quote from others, a mass of evidence might have

¹ Alanson Skinner, Notes on the Eastern Cree and Northern Saulteaux, *Anthropological Papers of the American Museum of Natural History*, vol. ix, part 1, p. 130.

been brought out that would have prolonged and extended this list far in excess of its present length, but I have given only some of the examples that have come to my personal knowledge in the course of a relatively brief experience. One fact that most archeologists do not seem to realize sufficiently is that stone was not the only material worked by the aborigines of the "stone age". Take, for example, the bowl carved from a knot, the woven bast or hemp bag, the specimen of porcupine quillwork—each is also a survival of the "stone age". As a matter of fact, the use of stone was comparatively limited. Edged tools, hammers, ornaments, and some weapons were the principal articles made of this material, whereas the bulk of the property in the hands of the savage was constructed of wood, clay, skin, or fabric.

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EDUCATIONAL THEORIES

EDUCATIONAL theories are beginning to assert a claim upon Anthropology—with what legitimacy the future must decide. Almost a decade ago one of our leading pedagogues, Dr G. Stanley Hall, of Clark University, in his *Adolescence* pointed out the need of a special study of the education of the children of lower peoples. Dr Frank Spencer, in his *Education of the Pueblo Child*, has attempted such a study as President Hall advocates. Until the present, however, no educational treatise, so far as we are aware, has incorporated the educational régime of primitive peoples as part of its organic scheme. This is now attempted by Dr Irving King, Assistant Professor of Education in the State University of Iowa. Chapter II of his *Social Aspects of Education* (Macmillan Co., New York, 1912), treats, under the title of "The Social Origin of Educative Agencies," of "the education of the Pueblo child," and "the social nature of education as seen in primitive life," containing, at the end, a list of "references on primitive types of education." "From the point of view of moral character alone," he writes, "it is doubtful whether the educational activities of the higher races are as efficacious as those of savages." So far as social morality, interpreted as conformance with the prevailing ethical code, is concerned—the ideal in most systems of education—it seems *not* doubtful that the educational activities of the higher races are less efficacious than those of savages. Why have field-workers not interested themselves in this phase of savage life—seeing that it is one of the most important from the point of view of the